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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/438,206
Filing Date: November 12, 1999
Appellant(s): SHI ET AL.

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EXAMINER'S ANSWER

This is in response to the appeal brief filed November 23, 2005 appealing from the Office action mailed February 23, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,382,584	Balasubramaniam	1-1995
4,599,354	Shulman	7-1986
4,369,769	Edwards	1-1983

Potter et al., Clin Invest Med, 1996;19(4), Suppl:S98, #533

Selby, Neurosurgery, 1983;12(5):591

IDS submitted on June 21, 2005 have been considered and initialed.

(9) Grounds of Rejection

Upon reconsideration, the outstanding rejection under 35 USC 112, first paragraph with regard to the percentage of polyethylene glycol (PEG) employed is withdrawn in view of the Examples disclosed in the instant specification employing 50% of PEG in treating spinal cord injuries.

Furthermore, the outstanding provisional obviousness double patenting is maintained while the terminal disclaimer filed November 23, 2005 being processed. Once the terminal disclaimer is approved, the obviousness double patenting rejection will be withdrawn.

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 22-30, 38, 40, and 44 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for PEG with 40 to 3500 daltons, does not reasonably provide enablement for PEG 4000. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The instant claims encompass all range of molecular weight of PEG. From the teachings of Shelby, which is provided by the applicant along with the response filed November 24, 2004, it is known that PEG 4000 would cause dissolution of myelin and may cause manifestation of the loss of neural function. Therefore, in view of the teachings of Shelby, the employment of PEG 4000 is not enabled by the instant specification.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 22-29, 38-39 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/132,542. Although the conflicting claims are not

identical, they are not patentably distinct from each other because the '542 patent recites the method of treating a mammalian nerve tissue injuries with a biofusion materials. '542 teaches that the preferred biofusion material as polyethylene glycol (See claims 3 and 4 particularly) and the nerve tissue injuries can be spinal cord injuries (See claim 17). One of ordinary skill in the art would have been motivated to employ polyethylene glycol (the preferred agent in '542) in a method to treat spinal cord injuries (the specific recited nerve tissue injury in '542). Employing any preferred biofusion agents, such as polyethylene glycol, would have been reasonably expected to be useful in treating any nerve tissue injuries, including spinal cord injuries.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 22, 24-30, 38-40 and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balasubramanian (US Patent 5,382,584) in view of Potter et al. (Clin Invest Med, 19(4), Suppl.: S80, #533). Potter is reference of record.

Balasubramanian teaches a method of employing piperazinyl phenylacetamide compounds useful as treatment for spinal cord injuries broadly (see col. 4, line 2). Balasubramanian also teaches one of the routes to administer the piperazinyl phenylacetamide compounds as intrathecal (See col. 5, line 6). Balasubramanian also teaches when administering the piperazinyl phenylacetamide compounds parenterally, such compounds will be formulated into solution or suspension with suitable solvent such as polyethylene glycol 200-1500 (See col. 6, lines 17-27).

Balasubramanian does not expressly teach 4-aminopyridine, a potassium channel blocker, can be combined with method of treating spinal cord injury such as crushed spinal cord injury. Balasubramanian does not expressly teach specifically

administering the piperazinyl phenylacetamide compounds with polyethylene glycol 200-1500 intrathecally.

Potter et al. teaches the use of 4-aminopyridine to treat spinal cord injury (See #533).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ 4-aminopyridine with the piperazinyl phenylacetamide compounds of Balasubramanian to treat spinal cord injuries such as crushed spinal cord injury. It would have been obvious to one of ordinary skill in the art at the time the invention was made to administer the piperazinyl phenylacetamide with polyethylene glycol 200-1500 intrathecally in a method to treat spinal cord injuries.

One of ordinary skill in the art would have been motivated to employ 4-aminopyridine with the piperazinyl phenylacetamide compounds of Balasubramanian to treat spinal cord injuries such as crushed spinal cord injury. 4-aminopyridine is known to be useful as treatment for spinal cord injury. The polyethylene glycol containing formulation of Balasubramanian is also known to treat spinal cord injury. Employing them concomitantly for treating the very same condition, spinal cord injuries, would be obvious (*In re Kerkhoven* 205 USPQ 1069).

One of ordinary skill in the art would have been motivated to administer the piperazinyl phenylacetamide with polyethylene glycol 200-1500 intrathecally (Note: a polyethylene glycol containing composition) in a method to treat spinal cord injuries such as crushed spinal cord injury. Since the piperazinyl phenylacetamide compounds of Balasubramanian are known to be useful to treat spinal cord injury. Administering

such compounds intrathecally, in solution form with polyethylene glycol 200-1500, to treat spinal cord injury would have been reasonably expected to be effective. It is known that polyethylene glycol is the exemplified solvent useful to dissolve the piperazinyl phenylacetamide compounds of Balasubramanian. Employing polyethylene glycol as the solvent would be considered as selecting from obvious alternatives. The skilled of artisan would possess all conventional administration method of the active compounds such as oral administration. The selection of one or another route of administration would be seen as a simple selection from among obvious alternatives.

Claims 22-30, 38-40, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shulman (US Patent 4,599,354) in view of Edwards (US Patent 4,369,769).

Shulman teaches a extended epidural pain relief composition containing 2.3% of PEG 3600 or with molecular weight of 1000-5000 (See col. 3, lines 32-42). Shulman also teaches this is preferably selecting the PEG that is non-toxic in a concentration required to perform the suspending function (See col. 6, lines 64-68).

Shulman does not expressly teach the epidural pain relief composition as useful in treating spinal cord injury.

Edwards teaches that spinal cord fracture and injury always cause pain (See col. 7, lines 22-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the PEG containing composition of Shulman in the treatment of spinal cord fractures and injury.

One of ordinary skill in the art would have been motivated to employ the PEG containing composition of Shulman in the treatment of spinal cord fractures and injury. It is known that severe spinal cord injury and fracture lead to pain. Therefore, administering the composition of Shulman epidurally would have been reasonably expected to be effective in relieving one of the symptoms of spinal cord fracture such as pain since the composition of Shulman is known to produce prolonged pain relief. Therefore, employing the composition of Sulman as one of the spinal cord injury treatment regimen would be considered obvious and reasonably expected to be useful.

(10) Response to Argument

Appellant's arguments filed November 23, 2005 in argument A1 averring a wide range of PEG under 4000 Dalton being useful in the present invention are unconvincing. Examiner notes that there is no teaching directed to the usefulness and effectiveness of PEG having molecular weight higher than 3700. It is also clear in the Examiner's discussion with regard to Selby that PEG 4000 is not effective. As the matter of fact, according to Selby, PEG 4000 will have detrimental effect on the spinal cord. Now the instant claims are so broad that they encompass Polyethlene glycol with any molecular weight. Other than showing PEG having molecular weight of 3700 or below may work, the specification does not provide sufficient guidance in the instant specification for enabling the full scope of the invention.

Appellant's arguments filed November 23, 2005 in argument A1, page 6 averring the loss-of-neural-function effect of PEG 4000 not being sufficient to establish the lack of enablement is unconvincing. Appellant does not even provide any probative evidence or arguments as to why the teaching of Selby, directed to the application of PEG 4000 resulting the loss of neural function of spinal cord, would not be sufficient to show the lack of enablement in the instant specification.

Appellant's arguments filed November 23, 2005 page 7 with regard to inoperable embodiments are not convincing. While "The presence of inoperative embodiments within the scope of a claim does not necessarily render a claim nonenabled. The standard is whether a skilled person could determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally required in the art. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1577, 224 USPQ 409, 414 (Fed. Cir. 1984) (prophetic examples do not make the disclosure nonenabling). Although, typically, inoperative embodiments are excluded by language in a claim (e.g., preamble), the scope of the claim may still not be enabled where undue experimentation is involved in determining those embodiments that are operable." See MPEP 2164.08(b). The operable embodiments disclosed in the instant specification are all under molecular weight of 4000 Dalton. There is no disclosure in the instant specification with regard to the effectiveness of other polyalkylene glycols other than polyethylene glycol; especially for the polyalkylene glycols with molecular weight higher than 4000 Dalton. Therefore, the

instant specification does not provide enabling disclosure for the full scope the subject matter recited in the claims.

Appellant's arguments in page 12 of the Brief filed November 23, 2005 averring the failure of Balasubramanian to teach the effective amount of PEG are not convincing. Examiner notes that there is no definite amount of PEG disclosed in the specification being excluded. The effective amount of PEG disclosed in the instant specification, page 12, lines 20-23 can be varied and for example, at least 40%. Balasubramanian teaches a composition containing PEG, in which the weight ratio of PEG is at most 99.9% when the active is 0.1% or 90% when the active is 10% and the vehicle contains only PEG. Examiner notes that the carrier materials can be both water and polyethylene glycols (See col. 6, lines 17-27). It is clear form the teachings of Balasubramanian, it indeed teaches the effective amount of PEG that would result in the recited effect when applied to the injured spinal cord.

Appellant's arguments in page 12 bridging page 13 averring the failure of the cited prior arts to teach the effective amount of polyalkylene glycol or PEG as effective to restore nerve impulse conduction through the injured spinal cord are not convincing. As discussed above, Balasubramanian clearly teaches the same amount of PEG being employed in the instant specification. The resulting effect (i.e., restore nerve impulse conduction through the injured spinal cord) must be present after the application of the PEG-containing composition to the injured spinal cord since the Products with identical chemical composition cannot have mutually exclusive properties. A chemical

composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present (See *In re Spada* 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) and also MPEP 2112.01).

Appellant's arguments in page 13 bridging page 15 averring the failure of the cited prior arts to provide motivation or suggestion or reasonable expectation of success to combine the teachings of the cited prior arts are not convincing. The motivation to combine the teachings of Balasubramanian and Potter is based on the fact that 4-aminopyridine is known to be useful as treatment for spinal cord injury. The polyethylene glycol containing formulation of Balasubramanian is also known to treat spinal cord injury. Absent evidence to the contrary, employing them concomitantly for treating the very same condition, spinal cord injuries, would be obvious (*In re Kerkhoven* 205 USPQ 1069) , at least additive effect is expected.

Appellant's arguments filed November 23, 2005 in page 15 bridging 16 averring the teaching away from Selby are not convincing. The formulation Shelby reported contains PEG 4000. However, the formulation cited by the PDR reference is not PEG 4000. It is rather PEG 3350. Therefore, the arguments are not convincing.

Appellant's arguments filed November 23, 2005 in page 16 and 17 averring the presence of unexpected results are not convincing. The disclosure in page 13, line 26 to page 14, line 2 are merely statements without supported by any evidence or data. Examiner notes that it is appellant's burden to demonstrate unexpected results over the prior art. See MPEP 716.02, also 716.02 (a) - (g). Furthermore, the unexpected results should be demonstrated with evidence that the differences in results are in fact

unexpected and unobvious and of both statistical and practical significance. *Ex parte Gelles*, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Inter. 1992). Moreover, evidence as to any unexpected benefits must be "clear and convincing" *In re Lohr*, 137 USPQ 548 (CCPA 1963), and be of a scope reasonably commensurate with the scope of the subject matter claimed, *In re Linder*, 173 USPQ 356 (CCPA 1972). In page 13, line 26 to page 14, line 2, as directed by the appellant, there is no data to evaluate unexpected results. Therefore, unexpected results are not seen to be present.

Appellant's arguments filed November 23, 2005 in page 17 bridging page 18 averring the failure of the cited prior arts to teach the effective amount that results in the recited desirable effect are not convincing. Examiner notes that there is no definite amount of PEG disclosed in the specification being excluded. The effective amount of PEG disclosed in the instant specification, page 12, lines 20-23 can be varied and for example, at least 40%. Giving the most broadest and reasonable interpretation, the effective amount can be any amount of PEG. With this in mind, Shulman clearly teaches the effective amount of PEG being employed since the amount of PEG disclosed in Shulman is 2.3%. The resulting effect (i.e., restore nerve impulse conduction through the injured spinal cord) must be present after the application of the PEG-containing composition to the injured spinal cord since the Products with identical chemical composition cannot have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are

necessarily present (See *In re Spada* 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) and also MPEP 2112.01).

Appellant's arguments filed November 23, 2005 in page 19 averring the synergistic effect of PEG and 4-aminopyridine are not convincing. As discussed above, the unexpected benefit has to be of a scope reasonably commensurate with the scope of the subject matter claimed, *In re Linder*, 173 USPQ 356 (CCPA 1972). In the instant case, the claims encompass not only polyethylene glycol, but other polyalkylene glycols of C1-C10. Therefore, the claims are still considered properly rejected under 35 USC 103(a).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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